Forest Health Protection
Pacific Southwest Region

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To: Patricia Grantham, Forest Supervisor, Klamath National Forest

Subject: Site visit trip report

As part of the annual trip forest Health makes to the Klamath National Forest to look at upcoming as well as past projects, I spent the May 28, 2019 with Travis Coughlin, James Kolesar, Andrew Mueller, and Chris Gulaian on the Goosenest District. We visited the Highway 97 portion of the Harlan Project, Herd Peak, and the South End Project. The objectives were to assess the current insect and disease conditions.

Observations and Discussion

Harlan Project – Highway 97 and Tenant Road

Figure 1. Ponderosa pine mortality and top-kill in Harlan Unit.

There were scattered patches of ponderosa pine mortality within the area we visited which was surrounded by fencing as a cattle grazing allotment. There was some western pine beetle found and a lot of flatheaded borer and Ips activity (Figure 1).

Bark beetles and wood borers tend to be opportunistic typically attacking trees weakened by disease, old age, injury, drought, or competition. In this situation, there has been extended drought from 2010-2016. Although there was a year of "drought relief" following the drought years, the year following was again very dry. Trees may take two to four years to recover from drought and the ones not able to recover in the single year may have been hit very hard by the dry conditions of 2018. These trees appear to continue to be affected by the extended drought. Soil

NORTHERN CALIFORNIA SHARED SERVICE AREA
3644 AVTECH PARKWAY, REDDING, CA 96002
(530) 226-2437

Cynthia Snyder
clsnyder@fs.fed.us

compaction by cattle and changes in the water level may have added to the stress on the trees.

The Harlan Project is listed as a vegetation management and fuels reduction project with an emphasis on improving forest resilience to wildfire, insects and disease, while improving mule deer habitat. It is expected to be signed in 2020 and implemented in 2021. Currently the Forest is removing hazard trees, with Caltrans, along the roads.

Herd Peak – white fir mortality

White fir mortality was occurring in natural stands between ponderosa pine plantations up Herd Peak. The mortality created openings ringed by dead and dying white fir of all age classes (Figure2). Laminate decay and rounded root wads where trees had fallen are consistent with Heterobasidion root disease, but no conks could be found in several stump excavations to provide a positive identification.

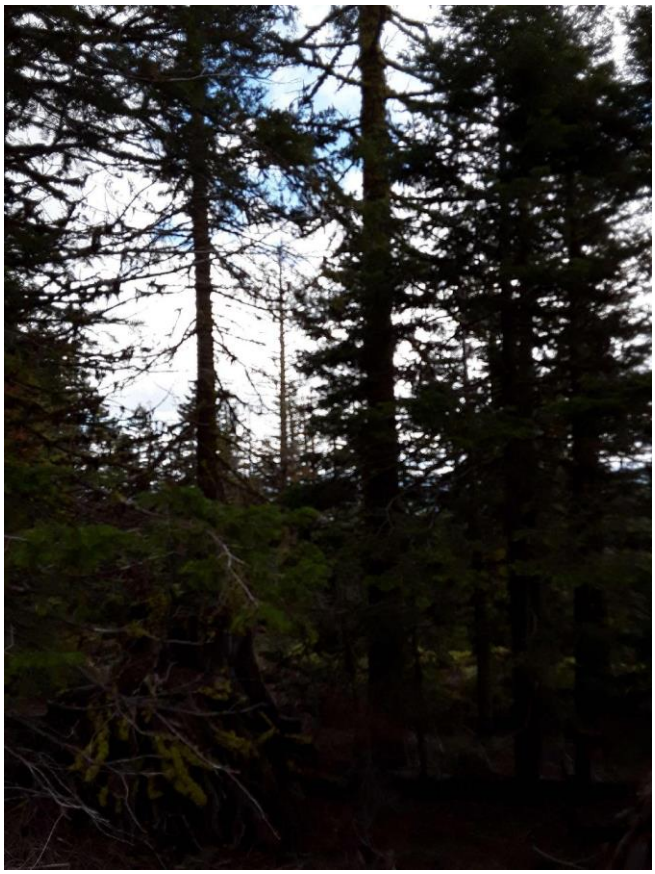

Figure 2. White fir mortality in suspected Heterobasidion root disease pockets.

Root Diseases caused by fungal pathogens, such as *Heterobasidion occidentale*, decay roots of their primary hosts. Heterobasidion root disease often becomes established by invading conifer stumps following cutting. It can persist and kill trees for decades once established. Infections in white fir cause excessive root and bole decay, leading to tree failure or increased susceptibility to fir engraver attacks during drought.

New infections can be prevented by treating freshly cut stumps with a registered borate compound. Large diameter stumps, greater than 14 inches, are most likely to be infected and create new root disease pockets.

On Herd Peak, where the symptoms are consistent with Heterobasidion root disease infection, species conversion may be the best option to reduce the ongoing mortality. Converting the white fir stands to ponderosa pine or other non-host species such as incense cedar would provide sustainable forest cover in the future.

South End Project – near Deer Mountain Snowmobile Park

The South End Project is still in the concept phase, but consists of lodgepole pine stands, used traditionally for post and pole sales and firewood cutting, that are currently reaching maturity. Mountain pine beetle was found present in the stand mostly as pitch-outs and strip attacks though one tree was found to be fully colonized (Figure 3). Green slash on the ground, possibly preemptive woodcutting, found colonized by Ips (Figure4). Average diameter was 10-12 inches and basal area 120-140 and higher further from the road where less woodcutting has been done.

Figure 3. Mountain pine beetle fully colonized lodgepole pine.

Figure 4. Ips attack on down lodgepole pine.

Because outbreaks usually develop in mature to over mature lodgepole pine, large reserves of these may pose a constant hazard in areas climatically favorable for the mountain pine beetle. There are some white fir and ponderosa pine scattered through the area and white fir makes up most of the understory. This may allow heavy thinning of the larger lodgepole to allow the residual stand to have greater species diversity. Thinning overly dense stands of trees to reduce competition and promote tree age and species diversity is the most successful forest management strategy to promote tree vigor and reduce susceptibility to mountain pine beetle. However, lodgepole pine is traditionally treated by clear cut and burn to remove white fir and allow the seeds of the shade-

intolerant species, such as lodgepole pine, to grow. This would also preserve the larger, fire resistant, ponderosa pine in the stands maintaining some species diversity.

Although none of the projects we visited are actively seeking Forest Health Protection funding, I was glad to provide insect and disease observations and discussion points during my visit. I would be happy to revisit any of these or other areas as projects on the District develop.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437.

/s/ Cynthia Snyder

CC: Travis Coughlin, James Kolesar, Andrew Mueller, Chris Losi, Sheri Smith, Phil Cannon, Chris Fischer